

INSTRUCTION MANUAL

UNREGULATED POWER SUPPLY

MODEL
LUS-I-06

MP MASTER



MA28928



LAMBDA

LAMBDA ELECTRONICS CORP.-MELVILLE, L. I., N. Y.

SPECIFICATIONS AND FEATURES

DC OUTPUT--Unregulated D.C. output voltage dependent upon load current

Max. Output Voltage: 330 VDC, no load
Max. Output Current: 25 ma, at full load

AC INPUT--105-132 VAC at 47-440 Hz. Input power: 10 watts at 132 VAC, 60 Hz full load.

OPERATING TEMPERATURE RANGE - Continuous duty from -20°C to +71°C ambient.

STORAGE TEMPERATURE -55°C to 85°C
(non-operating)

PHYSICAL DATA

Size 3 5/32" x 3 7/32" x 1 21/32"

Weight 1 lb. net; 1 7/8 lbs. shipping

Finish Grey, FED STD. 595 No. 26081

MOUNTING--Five surfaces, each with tapped mounting holes, can be utilized for mounting. See outline drawing.

OPERATION

The Lambda LUS-1-06 unregulated power supply is designed for use as a high-voltage source capable of delivering power to neon gas indicator tubes, eg., Burroughs *"Nixie" type B-5750.

Each Nixie tube requires the use of a series resistor to limit the current to within manufacturer's specified maximum and minimum current values. Because the output changes with loading, the series resistors must change value depending upon the number of tubes connected to the supply.

The resistor values used for the Burroughs type B-5750 "Nixie" tubes, are given in the following chart.

NO. OF TUBES	1	2	3	4	5	6	7
RES. VALUE (Ohms)	42.2K	37.4K	33.4K	29.9K	26.0K	22.6K	19.8K

NOTE: A maximum of seven (7) B-5750 tubes can be used with a power supply AC input of 105-132 VAC.

To determine the value of resistors used with tubes other than the B-5750, the nominal operating voltage and maximum - minimum allowable currents for the tube must be taken from the manufacturer's specifications.

Graph I represents a plot of output voltage (E_o) vs load current (I_{tot}) from no-load to full-load conditions. The lower curve is plotted for 105 VAC input and the upper curve is plotted for 132 VAC input. Accordingly, read minimum I_{tot} values on the lower curve and maximum I_{tot} values on the upper curve.

Graph I shows a typical load line using five B-5750 tubes. Note that load line passes through 150 VDC point (nominal tube voltage) on E_o axis.

Use graph I and the following formulas to determine the value for the current limit resistor R_{sn} .

*"Nixie" is a Trade-mark name of Burroughs Corp.

$$(1) \quad I_{tot} = I_t N$$

$$(2) \quad R_s \min = \frac{E_o \max - E_{tn}}{I_t \max}$$

$$(3) \quad R_s \max = \frac{E_o \min - E_{tn}}{I_t \min}$$

$$(4) \quad R_{sn} = R_s \min + \frac{(R_s \max - R_s \min)}{2}$$

Where:

I_{tot} = Total output current of power supply.

I_t = Allowable current in each tube.

N = Number of tubes connected.

$R_s \max$ = Max. value of limiting resistor.

$R_s \min$ = Min. value of limiting resistor.

E_{tn} = Nominal tube voltage.

E_o = Output voltage of power supply at $N \times I_t$. See graph I.

For example, when five B-5750 tubes are used, calculate as follows:

1. Tube data from manufacturer's specifications:

$$I_t \max = 3.5 \text{ ma}, \quad I_t \min = 1.8 \text{ ma}, \quad E_{tn} = 150 \text{ VDC}$$

2. Using equation (1) and tube data above, calculate a value for I_{tot} :

$$\text{For five tubes:} \quad I_{tot} \min = 1.8 (5) = 9 \text{ ma}$$

$$I_{tot} \max = 3.5 (5) = 17.5 \text{ ma}$$

3. Using Graph I:

$$E_o \min = 200 \text{ VDC} \quad @ \quad I_{tot} \min = 9 \text{ ma}$$

$$E_o \max = 235 \text{ VDC} \quad @ \quad I_{tot} \max = 17.5 \text{ ma}$$

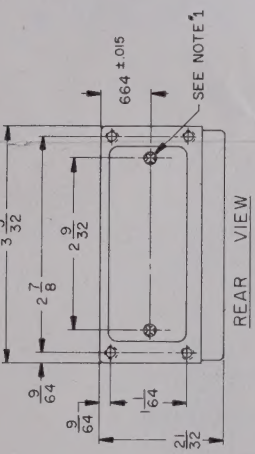
4. Equations (2) and (3) give:

$$R_s \min = \frac{235 - 150}{3.5} = 24.2K$$

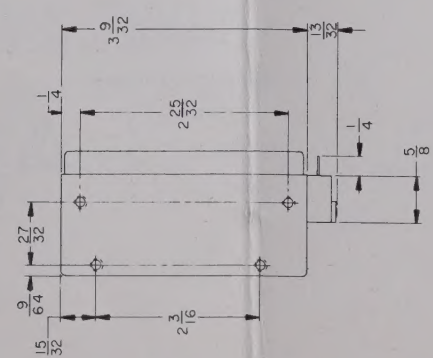
$$R_s \max = \frac{200 - 150}{1.8} = 27.8K$$

5. Substitute values in equation 4 to obtain R_{sn} :

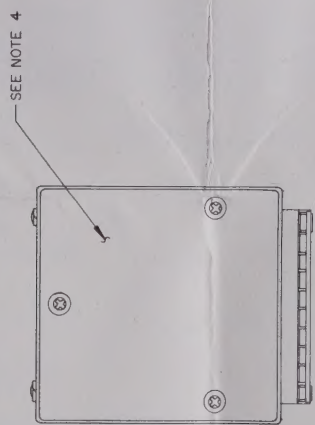
$$R_{sn} = 24.2K + \frac{(27.8K - 24.2K)}{2} = 26K$$



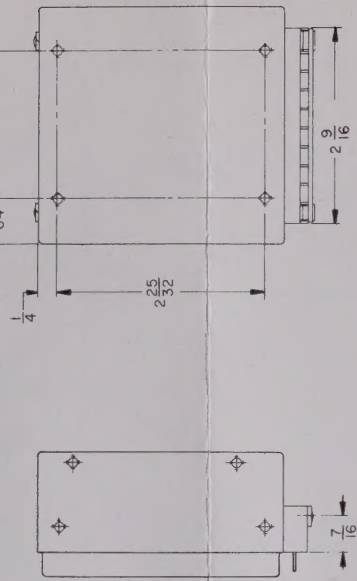
- NOTES:
1. WHEN MOUNTING ON THIS SURFACE, CUSTOMER MUST PROVIDE CLEARANCE FOR #4-40 COVER SCREWS
 2. WHEN MOUNTING ON THIS SURFACE, CUSTOMER MUST PROVIDE CLEARANCE FOR BARRIER STRIP
 3. ALL MOUNTING HOLES ARE TAPPED FOR NO. 6-32 SCREWS
 4. THIS SURFACE CANNOT BE USED FOR MOUNTING.



LEFT SIDE



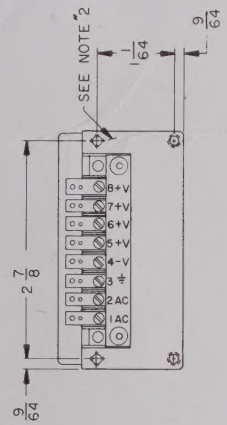
FRONT VIEW

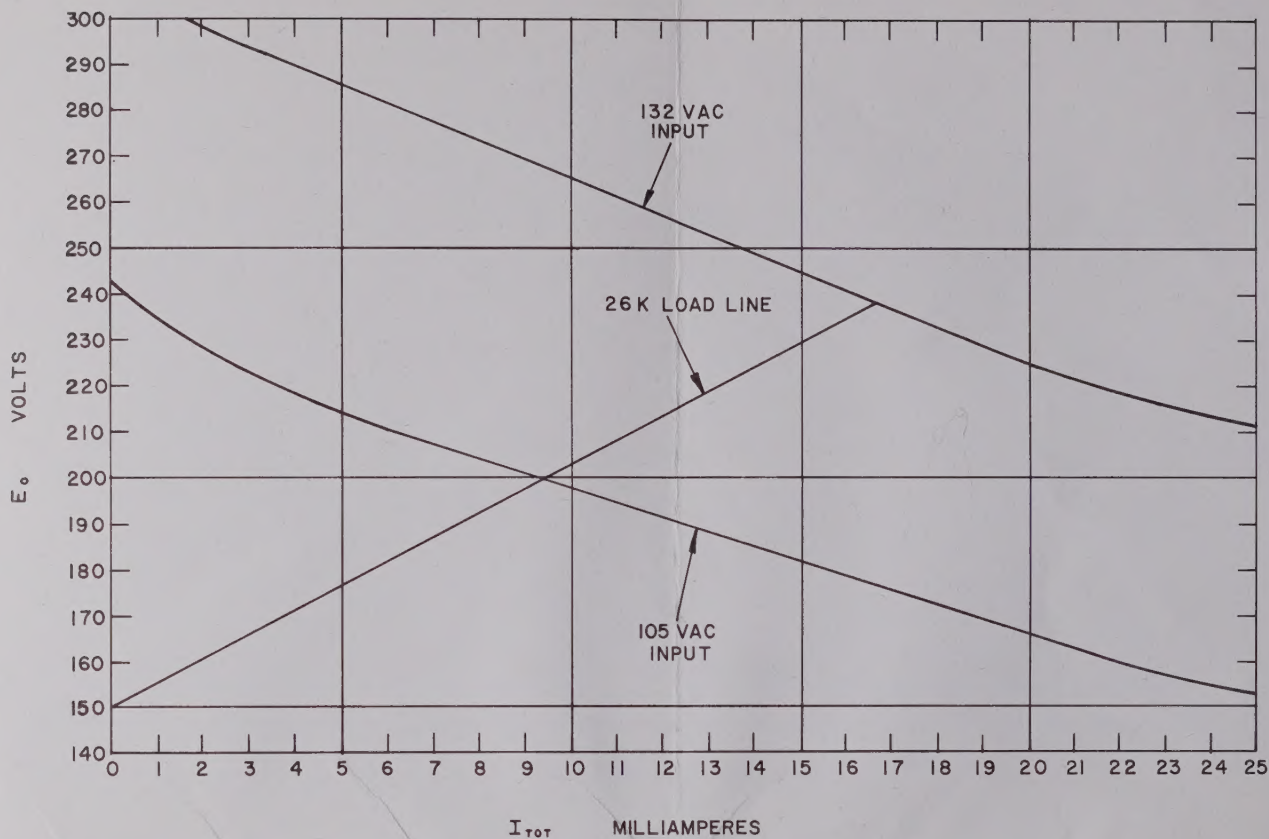


RIGHT SIDE

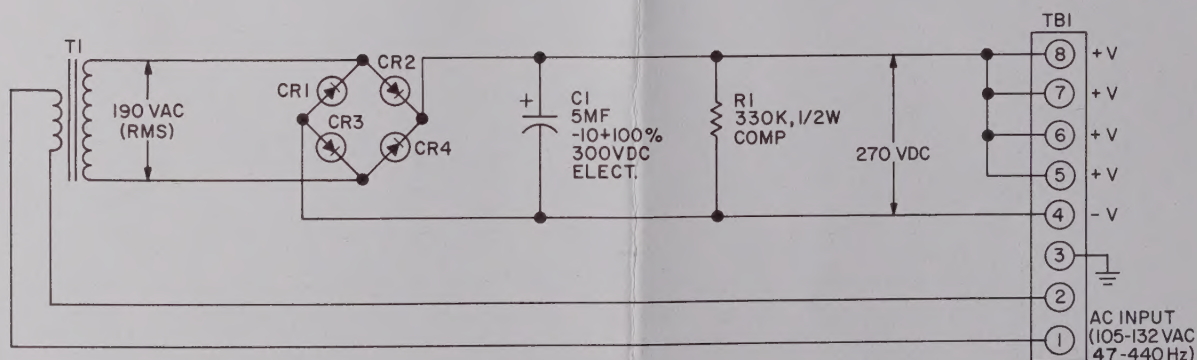
TOP VIEW

BOTTOM VIEW





Graph I. E_o vs. I_{tot}



NOTES

1. SYMBOLS:



LAMBDA PT. NO. FBL-00-064.



INDICATES CONNECTION TO CHASSIS.

2. CONDITIONS FOR CIRCUIT POINT MEASUREMENTS:

115 VAC 60Hz INPUT. NO LOAD.

THIS SCHEMATIC APPLIES TO UNITS
BEARING SERIAL NO. PREFIX A

SCHEMATIC DIAGRAM

MODEL
LUS-I-06



LAMBDA

ELECTRONICS CORP.
MELVILLE, L.I. NEW YORK

A **Veeco** SUBSIDIARY



5-Year Guarantee

We warrant each instrument manufactured by us, and sold by us or our authorized agents, to be free from defects in material and workmanship, and that it will perform within applicable specifications for a period of five years after original shipment. Our obligation under this guarantee is limited to repairing or replacing any instrument or part thereof, (except tubes and fuses) which shall, within five years after delivery to the original purchaser, be returned to us with transportation charges prepaid, prove after our examination to be thus defective.

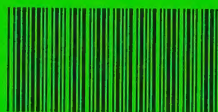
We reserve the right to discontinue instruments without notice, and to make modifications in design at any time without incurring any obligation to make such modifications to instruments previously sold.

LAMBDA ELECTRONICS CORP.

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